

# *Era Aviation Services*

Process Specification  
ERA-PS-4024

AIRCRAFT PAINT STRIPPING  
USING PLASTIC MEDIA

Initial Release, June 15, 2000

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ERA-PS-4024  
IR, 6/15/2000

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RECORD OF REVISIONS

REVISION	DATE	PURPOSE OF REVISION AND PAGES REVISED	AUTHOR	APPROVAL
I. R.	06/15/2000	Initial Release	M. Corning <i>M. Corning</i>	

**AIRCRAFT PAINT STRIPPING  
USING PLASTIC MEDIA**

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**AIRCRAFT PAINT STRIPPING  
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**SECTION 1**

**Purpose and Limitations**

**1.1 Purpose**

This specification provides the requirements and procedures for removing organic coatings (paints, primers, or lacquers) from the Bell 212, 412, Eurocopter BO-105 and Sikorsky S-76, S-61 aircraft and aircraft parts surfaces using plastic media blasting techniques. The plastic media blasting (PMB) procedures cited in this specification apply to open blasting only. For purposes of this specification, plastic media blasting shall be used on metal surfaces only.

**1.2 Limitations**

**The plastic media blasting procedures cited in this specification for the removal of organic coating from aircraft surfaces are prohibited for use on the following materials:**

- 1.2.1 Plastics whose design requirements specify they must remain transparent or translucent.**
- 1.2.2 Fiberglass (honeycomb and matrix-backed).**
- 1.2.3 Carbon fiber.**
- 1.2.4 Boron and graphite/epoxy.**
- 1.2.5 Antennas.**
- 1.2.6 Rotorcraft Main Rotor Blades and Main Rotor Blade Dynamic Components.**
- 1.2.7 Rotorcraft Tail Rotor Blades and Tail Rotor Blade Dynamic Components.**

## AIRCRAFT PAINT STRIPPING USING PLASTIC MEDIA

### SECTION 2

### Material and Equipment Requirements

#### 2.1 Material

##### 2.1.1 Plastic Media

The plastic media used in this process specifications shall conform with Military Specification MIL-P-85891A, Type V, Acrylic (Thermoplastic), Grade "A", No. 5 white. The plastic media type used in this PMB operation shall be manufactured from an virgin acrylic plastic in accordance with the requirements for Type V, grade A plastic media in MIL-P-85891A. The shape of this acrylic media shall be irregular with sharp angular edges and with a hardness of 46 to 54 using the Barcol hardness scale. The size of the acrylic media shall be 30/40. Supplier for Plastic Media, Size 30/40 is U.S. Technology Corporation, 220 7th Street, Canton, OH 44702

#### 2.2 Equipment Requirements

##### 2.2.1 Pauli & Griffin Pram 21 Dry Stripping Machines

Pauli & Griffin PRAM 21 is a portable Dry Stripping and Reclaiming Machine consisting of a fully accessorized PRAM 11 Dry Stripping Machine; and a triple reclaimer with an easily adjustable air wash, vibrating screen 840 CFM dust cyclone separator and 1000 pound storage hopper; 840 CFM dust collector powered by 7 ½ HP, TEFC, 220/440 volt, 3 PH motor/blower. PMB equipment shall be operated and maintained in accordance with Pauli & Griffin Pram Drystripping Machine Operations Manual Pram 21. The blasting nozzle and plastic media transport hoses shall be visually inspected prior to each use for excessive wear. Clean PMB separators prior to coating removal of each aircraft.

##### 2.2.2 Pauli & Griffin Pram 31 Plastic Media Blast Pressure Cabinet

The PRAM 31 consist of a cabinet with large, sealed blast area, an ASME coded pressure vessel with a 60 degree conical bottom; an 840 CFM cyclone reclaimer and a 840 CFM dust collector. The entire system has been designed specifically for blasting and reclaiming plastic media.

##### 2.2.3 3M Whitecap W-8000 General Purpose Helmets

Whitecap General Purpose Helmets are designed for applications such as grinding, chipping, spray painting, bagging, and loading operations. An extended length should also available. Match the shroud to the specific job applications.

##### 2.2.4. 3M Air Control Devices W-3862 Vortex Cooling Assembly & W-2863 Vortemp Heating Assembly

The W-2862 Vortex cooling and the W-2863 Vortemp heating assemblies are used to regulate the flow and temperature of compressed air to 3M hoods and helmets. These NIOSH/MSHA approved assemblies create comfortable positive pressure in the hood or helmet.

##### 2.2.5. Pionox Carbon Monoxide Monitor Models CM101 & CM102

The CM101 & CM102 Carbon Monoxide Monitor is designed to monitor the level of carbon monoxide in an ambient environment or as a respiratory air system. The standard display provides a digital read-out in PPM. The monitor alarms when present threshold limit is exceeded. Audio and visual alarms are standard equipment. The monitor is mounted in a NEMA-12 enclosure.

##### 2.2.6. Bullard Model 41 Airline Filter

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Bullard airline filters can be used in conjunction with other compressor safeguards to supply cleaner air to airline respirators and many pneumatic tools and systems. Bullard filters are designed to remove 98% of particals down to ½ micron size, but will not remove carbon monoxide and other toxic gases from the airline. The Bullard filter shall be drained daily with air pressure on. Replace filter every three months

- 2.2.7. Tyvek Booties: Booties 903, Lakeland Industries, or equivalent.
- 2.2.8. Kleen Guard Suit, Suit Model DP Kimberly-Clark Corporation or equivalent.
- 2.2.9 Welder Gloves
- 2.2.10. Hearing protection.
- 2.2.11. Wypalls
- 2.2.12 M & P Naphtha
- 2.2.13 Sand Blast Stencil Tape
- 2.2.14 Rubber Sheeting
- 2.2.15 Shurtape PC-657
- 2.2.16 6 Mil Polyethylene sheet and 3 Mil Polyethylene sheet
- 2.2.17 Methyl Ethyl Ketone (MEK) or equivalent.

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### SECTION 3

#### Aircraft and Aircraft Parts Preparation

##### 3.0 General:

The following PMB instructions are for masking the aircraft without components installed. Be sure to follow the appropriate procedure based on condition of the aircraft. Follow all caution and warning statements, as they are an integral part of these procedures. Surface preparation and tape application are key factors in the prevention of PMB contamination. The masking surface must be free of oil, grease, dirt, etc. To allow for a suitable seal at those locations. In addition, the masking surface should be as uniform as possible. The use of solvents, cleaning agents, and mechanical devices recommended by standard practices are an acceptable means, unless stated otherwise, by which to prepare the masking surfaces. Use only approved tapes and coverings through out the masking process. Mask off required areas on the aircraft using two (2) layers of tape, plastic polyethylene sheet, unless state otherwise. The first layer of tape is the outline layer. The second layer secures the polyethylene sheet or rubber sheeting in place. If no covering is used, apply (2) layers of approved tape for maximum protection. All tape should be applied using firm pressure to the entire length of the tape. Ensure tape is securely attached to masking. If a covering is needed, use 3 mil polyethylene sheet or equivalent as a dust shield, or 6 mil polyethylene sheet or equivalent as a blasting shield, unless otherwise stated.

##### 3.1. Aircraft engine deck, transmission deck, and tailboom mounting area without components installed.

- 3.1.1 Prepare cabin rear wall, engine deck, transmission deck, and the tailboom mounting cone for PMB by wiping the decks with MEK and rags until they are free of all contaminants that would interfere with the masking process.
- 3.1.2 Cap or plug all drain lines and fuel lines first. Second apply approved tape to caps or plugs to close off drain lines and fuel lines, apply approved tape to engine deck and transmission deck electrical connectors and battery box electrical connections to stop any intrusion of plastic media.
- 3.1.3 Install protective caps on transmission A frame lug bearings.
- 3.1.4 Masked opening with approved tape and install used hardware on the engine deck, engine mount tower, transmission deck, tailboom mounting cone, and cabin rear wall using standard practices that will not allow intrusion of the plastic media into unwanted areas if applicable.
- 3.1.5 Apply an outline layer of approved tape to the rear wall, engine deck, transmission deck and tailboom mounting cone dzus rail.
- 3.1.6 Apply 6 mil polyethylene sheet to the outline layer of approved tape in step 1.5 with one layer of tape.

- 3.2. Aircraft fuel system area. All aircraft shall have the fuel storage system and components removed prior to PMB. In addition, ensure any remaining fuel system supply items are properly protected from plastic media intrusion using approved methods. If for any reason, a fuel system supply item cannot be adequately protected from PMB intrusion using approved caps, plugs or masking methods. It shall be removed and reinstalled.

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- 3.2.1 Mask off all fuel system access openings, using two (2) layers of tape and polyethylene sheet. In addition, install fuel system access panels and/or if masked opening is in a blasting area, install rubber or metal blast shield, where applicable.
- 3.2.2 Ensure all fuel system supply items (i.e. lines, switches, filters, etc.) Are removed and/or properly protected from plastic media.
- 3.3 Aircraft interior area.

Due to the variance in aircraft interiors and the extent of disassembly the level of masking in the interior area will be based on the condition of the aircraft. Special attention should be given to electrical equipment, special or optional equipment, interior coverings and accessories installed inside the aircraft during the PMB masking procedure. If an item can not be adequately protected from plastic media intrusion, it should be removed from the interior of the aircraft.

  - 3.3.1 Apply 3 mil polyethylene sheet or a large trash bag over interment panel, overhead circuit breaker panel, and the voltage regulator panel and seal using tape.
  - 3.3.2 Reinstall interior access panels and tape edges where applicable.
  - 3.3.3 Cap or plug disconnected fuel, oil or air lines with approved caps or plugs and secure with tape.
  - 3.3.4 Mask entire floor area with approved tape and 3 mil polyethylene sheet using standard practices.
  - 3.3.5 Mask off any opening or areas in aircraft interior that will assist in the prevention of plastic media intrusion.
- 3.4. Aircraft door areas.
  - 3.4.1 Apply an outline layer of approved tape all around door openings.
  - 3.4.2 Cut two layers 6 mil polyethylene sheet to fit door openings, and attach using tape.
- 3.5. Window masking procedure.
  - 3.5.1 Wipe windows with V M & P Naphtha and wypalls until clean.
  - 3.5.2 Apply outline layer of approved tape on top of proseal on all window edges.
  - 3.5.3 Tape two layers of 6 mil polyethylene sheet as a blasting shield to the windows with tape on top of outline of previous layer of tape in a stepwise fashion.
  - 3.5.4 Apply a second layer of approved tape on the outline layer overlapping approximately 3/16 of an inch onto the window frame. For fiberglass surfaces, apply tape and overlap on window frame approximately 3/16 of an inch.



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3.6. Aircraft exterior area.

If unable to adequately protect airframe drains on aircraft exterior from plastic media intrusion, disconnect, isolate and/or remove from associated aircraft system and replace with approved caps, plugs and/or tape, prior to plastic media blasting (PMB).

- 3.6.1 Mask nose door openings with an outline layer of tape overlapping a ½" on all sides.
- 3.6.2 Apply two layers of 6 mil polyethylene sheet and secure with tape to nose doors.
- 3.6.3 Mask static ports and pitot tubes with two layers of tape.
- 3.6.4 Mask boost pumps access panels and fuel sump valves with tape overlapping a ½" on all sides and cover with 6 mil polyethylene sheet and additional tape.
- 3.6.5 Apply an outlined layer of tape around landing light belly panel opening overlapping 1" on all sides.
- 3.6.6 Attach two layers of 6 mil polyethylene sheet to masking secured by 3.6.5 with tape.
- 3.6.7 Mask anticollision light opening on the belly with two layers of tape.
- 3.6.8 Mask two each float cannon plug receptacle on the belly with two layers of tape.
- 3.6.9 Mask four each cross tube lug area opening with approved tape making sure legs are exposed.
- 3.6.10 As required, mask the ECU bleed air line forward fiber glass cover with tape and 6 mil polyethylene sheet.
- 3.6.11 Mask fuel filler neck opening with two layers of tape.
- 3.6.12 Cap or plug all drain lines first. Second apply approved tape to caps or plugs to close off drain lines to stop any intrusion of plastic media.
- 3.6.13 Mask fuselage tailboom mount flange opening with tape and 6 mil polyethylene sheet.
- 3.6.14 Place hardware in lower fuselage bolt and screw holes where needed.
- 3.6.15 Ensure all cut-outs and openings on exterior of aircraft for any special or optional equipment (i.e. heaters, air-conditioning, etc.) are properly masked off.
- 3.6.16 Ensure all exterior aircraft accessories, i.e lights, switches, etc., are properly masked off.
- 3.6.17 Map exterior skin using manufactures manuals, mark area of thin skins, (.030 or less), composite materials and any other special areas using a grease pencil. To mark boundaries and identify these surfaces to the PMB technician as areas requiring additional care.

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3.7. Tailboom masking procedures.

Disassemble tailboom assembly prior to PMB. by removing all components.

3.7.1 Assure that the wiring harness in forward and aft section of tailboom are inserted into the interior of tailboom and covered with 3 mil polyethylene sheet.

3.7.2 Mark horizontal stabilizer opening, antenna mount openings with tape and 6 mil polyethylene sheet.

3.7.3 Mask forward tailboom ring opening with tape and 6 mil polyethylene sheet.

3.7.4 Mask data tag and opening on aft tailboom lower pylon area with two layers of tape.

3.7.5 Mask hanger bearing bracket mount area and dzus receptacles for drive shaft cover on top cap of tailboom with two layers of tape.

3.7.6 Install used hardware in all nut plates, inserts and openings to prevent intrusion of plastic media.

3.7.7 Mask or plug any remaining openings on the tailboom to prevent intrusions of plastic media into unwanted areas.

3.7.8 If tailboom is painted and installed on aircraft, cover it with 3 mil polyethylene sheet and secure it with tape. Apply 1/8 inch by 12 inch rubber sheeting on forward end of tailboom and secure it with two layers of tape.

3.8. Visual Inspection

Final check of aircraft for plastic media blasting preparation shall be performed by PMB personnel. Conduct a final walk around check of masking to include all tape and covering for proper bonding. Ensure all openings, holes, etc. are properly sealed to prevent PMB intrusion. All discrepancies must be corrected prior to commencement of plastic media blasting.

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SECTION 4

Aircraft Coating Removal

4.1 General

If during the blasting operation, any of the masking material fails or unbonds immediately stop blasting and correct condition before continuation of blasting operation. If media intrusion is evident contact the appropriate personnel. During the blasting process, ensure that the dimensional tolerances, surface roughness and surface coatings are not altered beyond published limits.

4.2 Set up procedures.

4.2.1 Position airframe in the blasting booth, floor should be clean. Staging should permit easy access to all areas, and should be located to give blast operators a stand-off distance of at least 48".

4.2.2 Don protective work gear.

4.2.3 Equipment operation adjustments shall be set to meet the following requirements.

- 4.2.3.1 Air Pressure  $30 \pm 2$  PSI
- 4.2.3.2 Media Flow Rate 550-600 Lb./Hour
- 4.2.3.3 Stand-off Distance 24-36 (Inches)
- 4.2.3.4 Impingement Angle  $45^\circ$  (Degrees)
- 4.2.3.5 Dwell Time  $\leq 1$  Seconds

4.2.4 Using a hypodermic needle gauge, verify the indicated pressure reading at the nozzle (taken at a  $45^\circ$  angle away from the flow of the media) meets the requirements of 4.2.3.1.

4.2.5 The flow rate will be verified whenever new media is added or the media is changed.

4.2.6 Blast test.

4.2.6.1 Using 30 PSI nozzle pressure, 36" nozzle distance, 45 degree nozzle angle, note removal rate, note surface texture, listen for substrate (aluminum or magnesium only) "talking back or moving slightly".

4.2.6.2 If surface produces a low rumble, stop immediately. Continuing at this distance, pressure and angle will produce metal stretch. Move six inches further away from the surface, and note surface as above.

4.2.6.3 If this is satisfactory, move nozzle six inches closer to check production texture and talking back. If production rate is better at this distance and texture is satisfactory and the metal is silent, move six inches closer and again note results. Continue this process until most desirable distance is established.

4.2.6.4 Avoid moving closer than 24 inches to surface when nozzle pressure is set at 30 PSI.

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4.3 Plastic Media Blasting Stripping Procedures

- 4.3.1 Remove the organic coating from the aircraft surface using plastic media Type V, Grade A using the operating parameters specified.
- 4.3.2 A certified operator should keep the nozzle moving at all times and maintain the standoff distance, pressure and impingement angle (Angle of attack) and dwell time. specified. All parameters based on a nozzle diameter of 0.50 inches.

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### SECTION 5

#### Aircraft Unmasking

##### 5.1 General

After blasting, inspect plugs and masking for integrity. If any plugs or masking appears to have failed, notify the appropriate supervisory personnel. In the event there is plastic media intrusion into a critical area (i.e. fuel system, oil system, component interior, etc.) An entry shall be made in the appropriate work order or logbook, and corrective action taken.

- 5.1.1 During the unmasking process, extreme care should be given to remote blasting media by using compressed air, it is during the unmasking process the media may find its way into unwanted areas. Take the time to remove media after each unmasking process. All personnel must remember that when using compressed air, one should consider compressed air as a tool and respect it as he would any other tool. Personnel must also use proper personnel protective equipment. Never used compressed air to remove media from clothing, and use a safety air chuck in any blow down process.
- 5.1.2 Blow entire aircraft with compressed air to remove blasting media from aircraft exterior.
- 5.1.3 Unmask upper and lower windshield and cabin roof window and repeat 5.1.2.
- 5.1.4 Remove all of the masking materials from the cabin rear wall, engine deck, transmission deck, and tailboom mounting cone and repeat 5.1.2.
- 5.1.5 Remove all of the masking material from the tailboom and repeat 5.1.2.
- 5.1.6 Remove all of the masking material from the door openings and sides of the fuselage and repeat 5.1.2.
- 5.1.7 Remove 3 mil polyethylene sheet from floor area and all of the masking material from the belly of the fuselage.
- 5.1.8 Remove all masking from masked items.
- 5.1.9 Inspect previously masked interior areas and crevices for dust or media particle presence and vacuum as required.
- 5.1.10 After aircraft is completely unmasked and majority of plastic media removed, washed and/or rinse aircraft with water, where applicable, to remove dust and remaining media.

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**SECTION 6**

**Facility Requirements**

- 6.1 Utilities: The PMB Facility shall be provided with the following utilities.
  - 6.1.1 Ventilation. A cross-draft ventilation rate of 70 to 130 feet per minute.
  - 6.1.2 Dust Collector. A dust collector system capable of removing dust particles from the recirculation system.
  - 6.1.3 Compressed Air. Compressed air shall have a maximum relative humidity of 60% at 70° Fahrenheit. Air shall be filtered to remove moisture, oil and solid particles.
    - 6.1.3.1 Moisture or oil in compressed air will cause the plastic media to clump, clogging the metering valve and producing erratic performance.
  - 6.1.4 Lighting. A minimum of illumination at the work surface to prevent shadows on the sides, top, and bottom of the work piece.

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**SECTION 7                      Training Requirements**

- 7.1 Personnel performing and supervising the PMB removal of organic coatings (lacquers, primers, and topcoats) from aircraft and component parts shall complete a three-phase training program.
- 7.2 The Director of Maintenance shall designate the source of PMB training
- 7.3 Phase one shall consist of documented lectures and demonstrations, training shall include the following topics:
  - 7.3.1 A general knowledge of abrasive stripping theory with plastic media and media characteristics.
  - 7.3.2 A general knowledge of the facility and media cleanliness requirements and an understanding of their importance.
  - 7.3.3 A thorough understanding of the contents of this specification as they relate to PMB parameters and applicable substrates.
  - 7.3.4 A specific knowledge of the aircraft, surfaces, parts, and coating systems to be removed.
  - 7.3.5 A specific knowledge of masking techniques and materials required to prevent plastic media intrusion into the aircraft and component interiors during PMB operations.
  - 7.3.6 A specific knowledge of pre-operation equipment use and maintenance.
- 7.4 Phase II shall consist of actual PMB equipment use on panels and aircraft parts to remove their organic coatings. This training phase shall be approximately 40 documented hours.
- 7.5 Phase III shall consist of apprentice training for at least one week. New operator(s) will be supervised by previously certified personnel or instructors during PMB of actual production aircraft.
- 7.6 A complete set of training records will be maintained at the Paint Shop office.

**PIONOX**  
**CARBON MONOXIDE MONITOR**  
**OWNERS MANUAL**  
**MODELS CM101 & CM102**

**PIONEER Engineering, Inc.**  
**P.O. Box 2047**  
**Flat Fork Road**  
**Wartburg, TN 37887**  
**615/346-7700**



# CARBON MONOXIDE MONITOR

## MODEL CM101 & CM102

The CM101 & CM102 Carbon Monoxide Monitor is designed to monitor the level of carbon monoxide in an ambient environment or a respiratory air system. The standard display provides a digital read-out in PPM. The monitor alarms when preset threshold limit is exceeded. Audio and visual alarms are standard equipment. The monitor is mounted in a NEMA-12 enclosure.

### SPECIFICATION

#### SERIES CM

#### ELECTRONIC CO MONITOR/ALARM

Model CM101 & CM102 is a continuous monitoring electronic carbon monoxide alarm, capable of accurately determining unsafe levels of CO in any air supply source. When unsafe levels of CO occur (over 10 PPM normally), the monitor will provide an audio/visual alarm. The monitor is capable of being directly plumbed into the discharge air from a low pressure compressor assembly. A high pressure version is available. The system is easily calibrated with span gas.

RANGE OF DETECTION	0 - 500 PPM
PRINCIPLE	Electrochemical oxidation cell
READOUT	Digital
CALIBRATION	Direct insertion of span gas
POWER	110 - 125V AC, or 12V DC
INPUT FITTING*	1/8" poly tube
INPUT FLOW*	.5 SCFH (Diffusion on ambient models)
INPUT PRESSURE*	0 - 100 PSIG 0 - 5000 PSIG optional
Min. Detectable Sensitivity	1.0 PPM
Rise Time 90%	Less than 45 seconds
Fall Time 90%	Less than 45 seconds
Precision	$\pm 0.5$ PPM
Accuracy	$\pm 0.5$ PPM
Operating Temp. Range	32°F to 105°F
Dimensions	7.5" H x 3.75" D x 4.5" W
Weight	Wall Mount 4.5 lbs.

#### MODEL

CM101  
CM102  
CM102B

#### DESCRIPTION

115 Volt A.C.  
12 Volt D.C.  
12 Volt D.C. with battery & charger

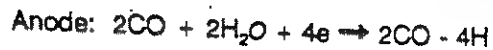
### DESCRIPTION

On compressed air versions, air enters the monitor through a filter and flow controller then to the sensor cell. An indicator on the front panel shows the proper flow rate. The electro chemical sensor cell determines the amount of CO present and sends a proportional signal to an integrated circuit, the respective concentration is presented on a digital display. Programmable audio/visual alarms provide an "alert" to potentially unsafe conditions. An auxiliary relay is also provided to operate remote alarms or control functions.

## SENSOR

The sensor uses special diffusion barrier technology which results in a direct electrical response to the CO concentration. It is relatively unaffected by changes in pressure and temperature.

Carbon monoxide diffusing to the sensor electrode (anode) reacts according to the equation:



At the counter electrode (cathode) the reaction is:



The oxygen required to support this reaction is supplied by the air.

Response time of the sensor to 90% of the actual concentration is 40 to 50 seconds. Its normal sensitivity to carbon monoxide is 1.0 PPM. The sensor has no orientation sensitivity and is linear through its range.

Its operating temperature range is 32°F to 105°F. The best storage temperature range is 32°F to 80°F. In normal operating temperature, the sensor is expected to last 1 to 2 years and guaranteed for one (1) year.

The sensor contains a small volume of strong sulfuric acid gel. In the unlikely event of a leak, the contaminated parts should be thoroughly rinsed in water. The design of the sensor is protected by international patents.

## SWITCHES

The front panel contains the following switches:

Power Switch - Two (2) positions: "ON", "OFF".

Mute Switch - Two (2) positions: "ON", "OFF".

## ALARMS

Audio/Visual alarms are provided to "alert" potentially unsafe conditions.

When in alarm, the front panel alarm indicator lights until the gas level drops below the preset alarm point. Factory set at 10 PPM unless otherwise specified.

## INDICATORS

Power On - Indicated by illumination of the digital display.

L.C.D. Display - Digitally indicates the CO concentration in PPM

Visual Alarm - A red LED

Audio Alarm - A 110 db generator standard, larger, A/V alarms optionally available.

Flow - A flow indicator (red in no flow condition) is provided to ensure that an adequate air sample is delivered to the CO sensor cell. The proper flow is indicated by 50/50 red/green indication. If an adjustment is necessary, turn the flow control knob clockwise to increase flow. It is not necessary to have exactly a 50/50 presentation, anything from 60/40 to 40/60 is acceptable.

A combination threaded gas port is provided on the bottom of the monitor for both calibration and sample inlet.

## INSTALLATION

The monitor is supplied in a NEMA box and can be wall mounted. Pressurized air is supplied to the monitor through 1/8" tubing supplied in the installation kit. Internal pressure regulators reduce the pressure to the proper level.

## CONNECTING THE POWER

The instrument may be connected to 110V AC with the standard line cord provided, (for 12V DC consult factory). Be careful not to reverse the polarity if connecting the 12V DC, although no damage to monitor will result, it will not work.

## CALIBRATION

Use 10 to 15 PPM "certified" calibration gas.

### NOTE

The calibration adaptor fitting (on the span gas regulator assembly) connects to the span gas cylinder to the span port of the instrument.

1. Power the CO Monitor for at least five (5) minutes.
2. "Zero" - To do so it is necessary to purge the monitor with "zero" air or stop the flow. After approximately one (1) minute of "no flow" all CO will be oxidized and the meter can be "zeroed". Turn the zero "Z" potentiometer till the L.C.D. display reads "000". The monitor may not zero properly if it is in a contaminated area. Should this occur move the monitor to a clean environment and proceed with step 1. If you are unable to move to a clean environment, consult the factory to attain a certified gas cylinder of 0 ppm.
3. Connect the calibration regulator to the span gas canister.
4. "Calibrate" - Slowly open the calibration regulator valve so that the pressure from the span gas canister is delivered to the monitor.
5. Adjust the flow control valve on top of the calibration regulator, as required, to establish the proper flow rate.
6. Wait for the reading to stabilize, (approximately 1 to 2 minutes). If needed, adjust the "span" screw until the indicator shows the correct reading, as marked on the span gas container.
7. Purge the monitor as in step 2 and check "zero".
8. Disconnect the span gas canister from regulator for storage.
9. The CO Monitor has been factory set to alarm at 10 PPM. To change the alarm setting consult factory.

## **MAINTENANCE**

Normally the only maintenance required is periodic calibration (every 4 to 6 weeks) and sensor cell replacement. The sensor cell has a life expectancy of one to two years. However, contamination, humidity and temperature extremes can shorten its life. A serviceable cell when disconnected (unplugged) will cause a negative reading on the display of from -1 to -3 PPM. A depleted cell will give no change and when unplugged, will show no change on the display. A defective sensor cell will exhibit an erratic readout.

On rack/panel mount monitors, remove left side panel (as viewed from front) and disconnect the plug leading to the sensor cell. Unsnap the cell from its holder and disconnect the plastic tube. Install new cell in reverse order. On wall mounted units open the hinged cover/door - the cell is mounted in the lower half. Proceed as above.

### **NOTE**

When the sensor cell is not connected to circuit board the two terminals of the cell should be shorted together with a jumper wire. This will extend the life of the cell.

PIONEER ENGINEERING  
BREATHING AIR SYSTEMS

DESCRIPTION

CO MONITOR  
MODELS CM-101 & CM-102

SCALE: NONE

DATE: 4-4-91

DR. BY D. W. KYLE & R. M.

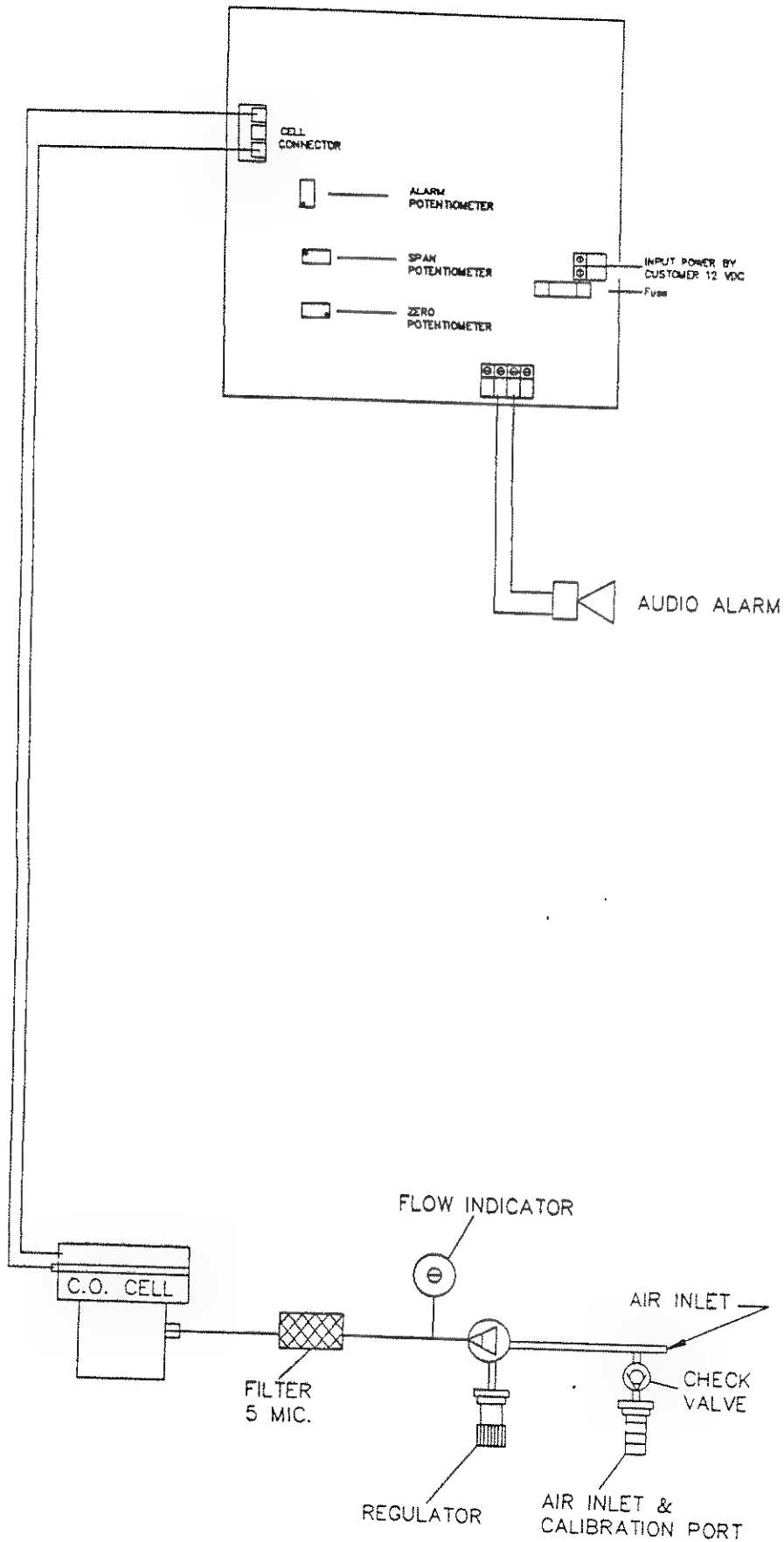
CK. BY

DRAWING NUMBER

REVISION

B

DRAWING, DESIGN, OR OTHER DISCLOSURES ARE PROPERTY OF PIONEER ENGINEERING



# WARNING

Misuse of compressed air can be dangerous. The importance of taking every precaution in the use of compressed air and its associated equipment cannot be stressed too strongly.

Always remember to release all air pressure from the compressor system before repairing or doing maintenance work.

**NEVER**

Tighten a pipe fitting that is under pressure.

**NEVER**

Adjust a safety valve beyond the manufacturer's setting. A safety valve is installed to prevent overloading the air compressor and related system components. To interfere with its setting could result in serious damage or injury.

**NEVER**

Work on an air compressor assembly unless the electrical power is switched off at the main terminal (engine ignition off for gas or diesel driven units), and the compressor stopped.

**NEVER**

Pass in front of a shut off valve outlet when compressed air is being released. This is particularly dangerous because particles in the air stream could cause injury.

**NEVER**

Attempt to straighten badly bent tubes or reuse damaged fittings.

**NEVER**

Use worn or damaged components that rely on threads for security - i.e., nuts, bolts, nipples and drain valves, etc.

**NEVER**

Tamper with a live electrical circuit. If in doubt, call upon the services of a qualified electrician.

**NEVER**

Charge a cylinder beyond the rated working pressure.

**NEVER**

Charge a cylinder that is not properly documented or certified by A.S.M.E. or DOT/I.C.C. design codes.

**REMEMBER**

To have your compressors installed in accordance with local electrical code requirements.

**REMEMBER**

**COMPRESSED AIR CAN KILL. TREAT IT WITH RESPECT.**

# 3M™ Whitecap™ W-8000 General Purpose Helmets

Whitecap™ General Purpose Helmets are designed for applications such as grinding, chipping, spray painting, bagging, and loading operations.

An extended length shroud is also available. Match the shroud to the specific job application.

## Features

- Rugged polyethylene outer shell available in white or black.
- Removable inner shell for easy cleaning.
- Adjustable ratchet suspension.
- Clear, liftable face shield provides excellent vision and is easily replaced.
- Clear face shield covers prolong face shield life.

- Vinyl coated blue shrouds are chemical resistant and reusable.
- Interchangeable parts convert general purpose helmet to Whitecap abrasive blasting or welding helmets.
- System distributes air over upper torso, providing additional comfort.

## Includes

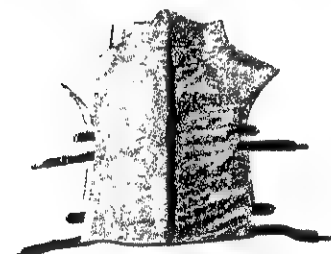
- W-8000 (white) or W-8000B (black) helmet.
- W-8020 inner shroud.
- W-8051 vinyl coated outer shroud.
- W-8045 clear face shield cover.
- W-2913 chin strap.

**Note:** Outer shroud required to meet NIOSH approval.



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## Replacement Parts



W-8052  
W-8057-2



W-8051  
W-8056-2



W-8035-10

W-8015-5



W-8025

- W-2878-2 suspension without ratchet (2 pack).
- W-2879 suspension with ratchet.
- W-2913-2 chin strap (2 pack).
- W-8004 air guide.
- W-8005 inner shell.
- W-8015-5 face shield brim (5 pack).
- W-8020-2 inner shroud – cotton (2 pack).
- W-8021-2 inner shroud, double cuffed (2 pack).
- W-8025 face shield mounting kit. Consists of 2 each pivots, knobs, friction washers, and mounting screws.
- W-8030 gasket kit. Consists of gasket, fasteners and strap.
- W-8031-5 face shield clips (5 pack).

- W-8032 gasket screw kit.
- W-8035-10 outer face shield (10 pack).
- W-8036-5 high temperature face shield [up to 225°F (107°C), 325°F (163°C) intermittent] (5 pack).
- W-8045-25 face shield covers – clear (25 pack).
- W-8045-250 face shield covers – clear (250 pack).
- W-8051 reusable standard length shroud assembly (includes W-8061 shroud clamp).
- W-8052 reusable extended length shroud assembly (includes W-8061 shroud clamp).

- W-8056-2 reusable standard length shroud only (2 pack)\*.
- W-8057-2 reusable extended length shroud only (2 pack)\*.
- W-8060-10 general purpose helmet knobs (10 pack).
- W-8061-2 shroud clamp (2 pack): Reusable with replacement shrouds.
- W-8065-4 friction washers (4 pack).
- W-8160-10 optional inner face shield. Clear acetate (10 pack).

\*Shroud clamp not included.

# 3M™ Air Control Devices

## W-2862 Vortex Cooling Assembly W-2863 Vortemp™ Heating Assembly

The W-2862 Vortex cooling and the W-2863 Vortemp heating assemblies are used to regulate the flow and temperature of compressed air to 3M hoods and helmets. These NIOSH/MSHA approved assemblies create comfortable positive pressure in the hood or helmet.

### Specifications

- Vortex can cool compressed air by up to 50°F (10°C).
- Vortemp assembly can warm compressed air by up to 50°F (10°C).
- Requires 60-100 psi depending on hose length (see chart).
- Requires 15 cfm (425 liters/min.) of air for maximum efficiency.
- No moving parts minimizes maintenance.

### Assemblies Include

- Vortex cooler or Vortemp heater with quick disconnect.
- Waist belt.
- Assembly holder.

### Vortex Assembly Replacement Parts

- W-1279-2 Hansen plug.
- W-2963 waist belt.
- W-3016 Vortex holder kit.
- W-3033 spare parts kit.
- W-3186-2 plug. Compatible with Schrader 1/4" MPT (2 pack).
- W-3274-2 plug. Compatible with Duff-Norton (2 pack).
- W-6804 Vortex cooler.

### Vortemp™ Assembly Replacement Parts

- W-1279-2 Hansen plug.
- W-2818 Vortemp tube only.
- W-2963 waist belt.
- W-3017 Vortemp holder kit.
- W-3035 spare parts kit.
- W-3186-2 plug. Compatible with Schrader 1/4" MPT (2 pack).
- W-3274-2 plug. Compatible with Duff-Norton (2 pack).

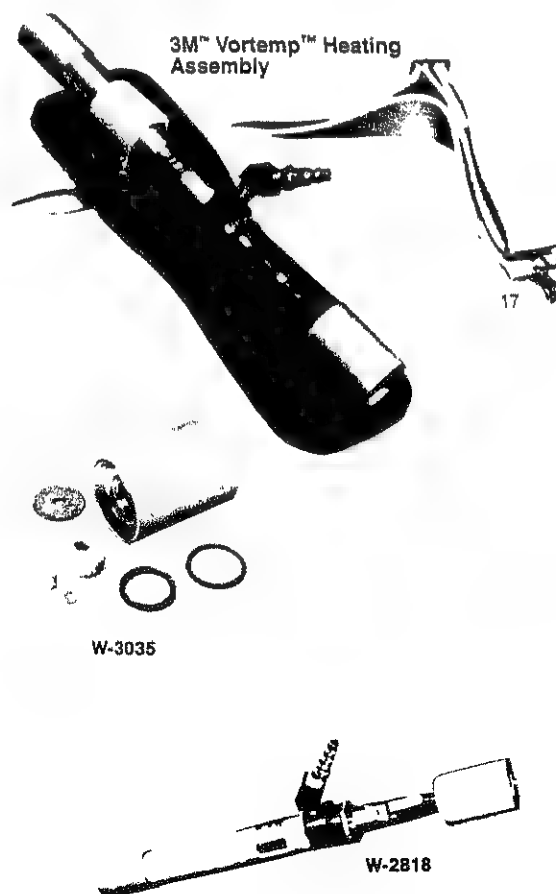
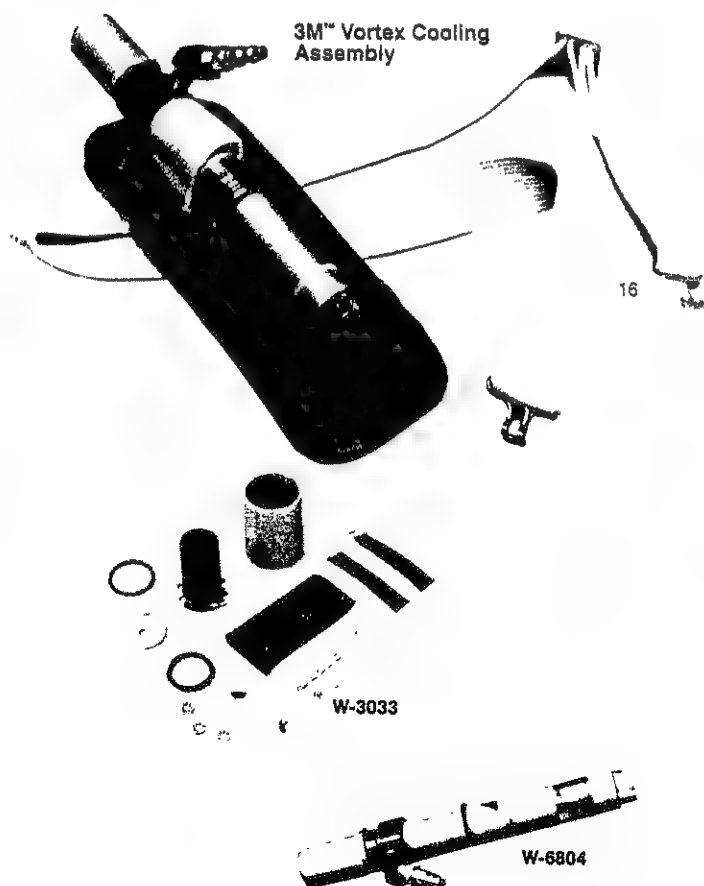
### Approved Lengths and Pressures for 3M Compressed Air Hoses

W-9435 <sup>1</sup> (Rubber)		W-2929 <sup>2</sup> (Coiled)		Vortex Supply Pressure (psi)	Vortemp Supply Pressure (psi)
Feet	Meters	Feet	Meters		
25	7.62	25	7.62	60-75	60-70
50	15.24	50	15.24	60-75	65-75
100	30.48	100	30.48	65-80	65-85
200	60.96	N/A	N/A	80-90	75-85
300	91.44	N/A	N/A	85-100	85-95

1. W-9435 hose may be used up to 300 feet (91.44 m) in length. **No more than three separate hose sections can be used with each positive pressure respirator.**

2. W-2929 coiled hose may be used as a single length of 25, 50 or 100 feet (7.62, 15.24 or 30.48 m). **No connections are approved between coiled hoses.**

**Note:** The hose length and supply pressure requirements are also on a label attached to each Vortex, Vortemp or air control valve.





# OSHA Regulations

## 3M's Respiratory Protection Products Measure Up To OSHA's 11 Requirements\* On Respirator Use

### Requirement 1:

*"Written standard operating procedures (S.O.P.) governing the selection and use of respirators shall be established."* 3M™ Compliance Software, a computerized program, allows you to develop a customized respiratory protection program that meets OSHA standards.

### Requirement 2:

*"Respirators shall be selected on the basis of hazards to which the worker is exposed."* 3M has a complete line of NIOSH/MSHA approved respirators that offer protection against a wide variety of workplace hazards. To help you select the right one, 3M offers 3M™ Select Software™, a computerized program to help make respirator selection fast, easy and accurate.

### Requirement 3:

*"The user shall be instructed and trained in the proper use of respirators and their limitations."* 3M has easy-to-follow respirator training programs designed to help you meet OSHA guidelines. 3M also has fit testing equipment available.

### Requirement 4:\*\*

*"Where practicable, respirators shall be assigned to individual workers for their exclusive use."*

\*29 CFR Part 1910.134(b). Requirements of a minimal respirator program.

\*\*Requirement 4 is only advisory.

### Requirement 5:

*"Respirators shall be regularly cleaned and disinfected. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use."* 3M™ Respirator Cleaning Wipes help you comply with OSHA's 'Fifth Requirement,' as well as the sound industrial hygiene practice of keeping all types of personal protective safety products clean.

### Requirement 6:

*"Respirators shall be stored in convenient, clean and sanitary locations."* 3M respirators can be stored in their original containers or in a 3M dispenser until used.

### Requirement 7:

*"Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use."*

### Requirement 8:

*"Appropriate surveillance of work area conditions and degrees of employee exposure or stress shall be maintained."* 3M™ Diffusional Monitors may be used to survey for many gases or vapors.

### Requirement 9:

*"There shall be regular inspection and evaluation to determine the continued effectiveness of the program."*

### Requirement 10:

*"Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually)."*

### Requirement 11:

*"Approved or accepted respirators shall be used."* 3M has an extensive line of NIOSH/MSHA approved respirators.

## ⚠ WARNING



Each respirator must be properly selected based on the contaminant and concentration levels to which the worker is exposed. Failure to follow the use and fitting instructions and warnings for proper use contained on the respirator packaging and/or failure to wear the respirator during all times of exposure can reduce respirator effectiveness. **Misuse may result in sickness or death.** As with the use of any respiratory protection device, the wearer must first be trained in the proper selection, use, limitations and maintenance of the product. Refer to the product literature and packaging for specific information regarding fit and use limitations.



# MODEL 41 AIRLINE FILTER USER INSTRUCTIONS

BULLARD AIRLINE FILTERS CAN BE USED IN CONJUNCTION WITH OTHER COMPRESSOR SAFEGUARDS TO SUPPLY CLEANER AIR TO AIRLINE RESPIRATORS AND MANY PNEUMATIC TOOLS AND SYSTEMS. BULLARD FILTERS ARE DESIGNED TO REMOVE 98% OF PARTICLES DOWN TO 1/2 MICRON SIZE, BUT WILL NOT REMOVE CARBON MONOXIDE AND OTHER TOXIC GASES FROM THE AIRLINE

## SET-UP

1. **Location:** Select a flat, stable location to place the filter. If the filter will be used in a permanent location or if stability is a problem, the legs can be mounted on a flat surface. If wall mounting is desired, use the Model 41-P6/WM, which is designed for such purposes.
2. **Hook-up:** Connect the piping coming from the compressor to the air inlet. Connect the airline hose that leads to your respirator or pneumatic tool to the filter outlet. Tighten the connections to prevent leaks and possible pressure loss. **IMPORTANT—WHEN USING A RESPIRATOR, DO NOT CONNECT THE FILTER TO ANY AIR SOURCE UNLESS YOU ARE CERTAIN IT CONTAINS BREATHABLE AIR.**

## OPERATION

### 1. AIR REQUIREMENTS

#### a. Air Source:

- Federal law requires that when oil lubricated compressors are used as sources of breathing air, you must equip them with high temperature alarms or carbon monoxide monitors/alarms, or both. If only a high temperature alarm is used, you must frequently test the compressor air for carbon monoxide to insure it meets the Grade "D" requirement discussed below.
- The law also requires that breathing air hose couplings be incompatible with outlets for other gas systems in order to prevent accidental connection of a supplied air respirator to non-respirable gases or oxygen.

#### b. Quality of Breathing Air:

Supplied breathing air passing through this filter to a respirator must meet at least the requirements for Type 1 gaseous air as described in the Compressed Gas Association Commodity Specification G7.1 (Grade D or higher), as specified by federal law 30 CFR, Part 11, Subpart J, 11.121 (b). The Bullard airline filter does not remove carbon monoxide and other toxic gases from the air being supplied. The requirements for Grade D breathable air include:

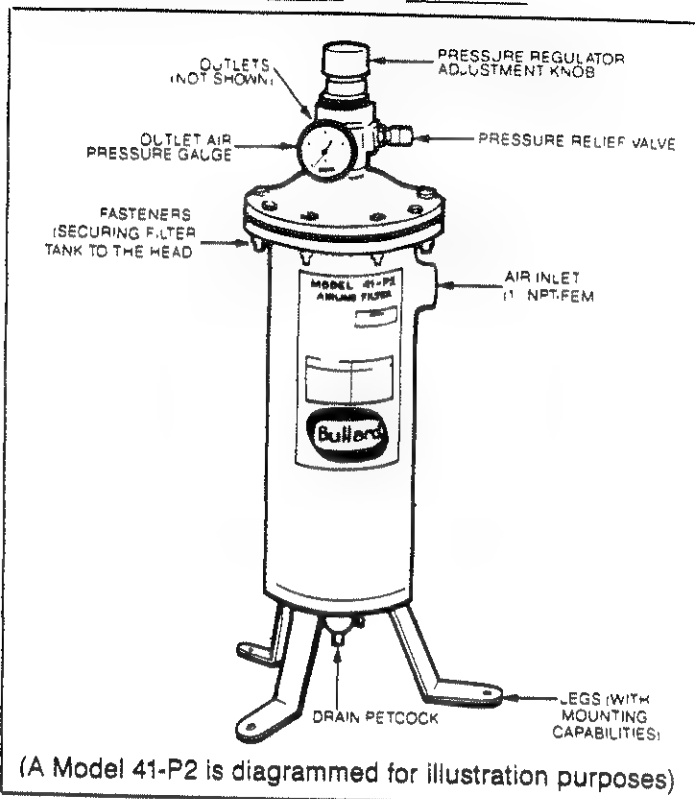
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|---|--------------------------|
| ■ Oxygen  | 19.5—23.0%               |
| ■ Hydrocarbons (condensed)<br>in Mg/m <sup>3</sup> of Gas                     | 5 mg/m <sup>3</sup> max. |
| ■ Carbon Monoxide   | 20 ppm max.              |
| ■ Carbon Dioxide  | 1000 ppm max.            |
| ■ No toxic contaminants at levels which would make the air unsafe to breathe. |                          |

Refer to the C.G.A. Commodity Specifications G7.1 for complete details. It is available from: Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

#### Air Pressure:

- The air pressure at the filter inlet should not exceed 100 psig. Air will be released by the pressure relief valve when pressure within the filter exceeds 125 psig.
- Air discharging from the filter can be controlled to meet specific air pressure requirements by using the pressure

Refer to diagram for set-up and operation:



(A Model 41-P2 is diagrammed for illustration purposes)

regulator adjustment knob. Refer to your respirator or pneumatic tool instruction manual to find the appropriate air pressures required for correct use of the equipment.

#### d. Temperature:

Air supplied to the filter should not exceed 140 °F (60 °C). Therefore, do not connect the filter directly to the compressor exhaust manifold.

### 2. CORRECT OPERATION PROCEDURES:

- a. **Drain** accumulated water and oil from the filter tank as required by opening the petcock valve. Normally the tank will need to be drained at least once a day. In humid climates though, or if large amounts of water and oil are present in the air supply, drain the filter tank more often.
- b. **Tighten** the fasteners which secure the head to the filter tank. Over time, the fasteners may loosen which could cause a leak in the air system. Standard tightness for fasteners of this type (3/8" grade 5) is 31 ft. lbs.

## WARNING:

**THIS FILTER DOES NOT REMOVE CARBON MONOXIDE AND OTHER TOXIC GASES**

\$74.90

Mike Hendrick

one pack laser

905-005

**PAULI & GRIFFIN**  
**PRAM™ 21 DRY STRIPPING MACHINES**  
**OPERATIONS MANUAL**

SPECIFICATIONS  
APPLICATIONS  
INSTALLATION  
OPERATION  
MAINTENANCE  
TROUBLE SHOOTING  
REPLACEMENT PARTS

<sup>B</sup>  
Q & H air tools

504-752-4884

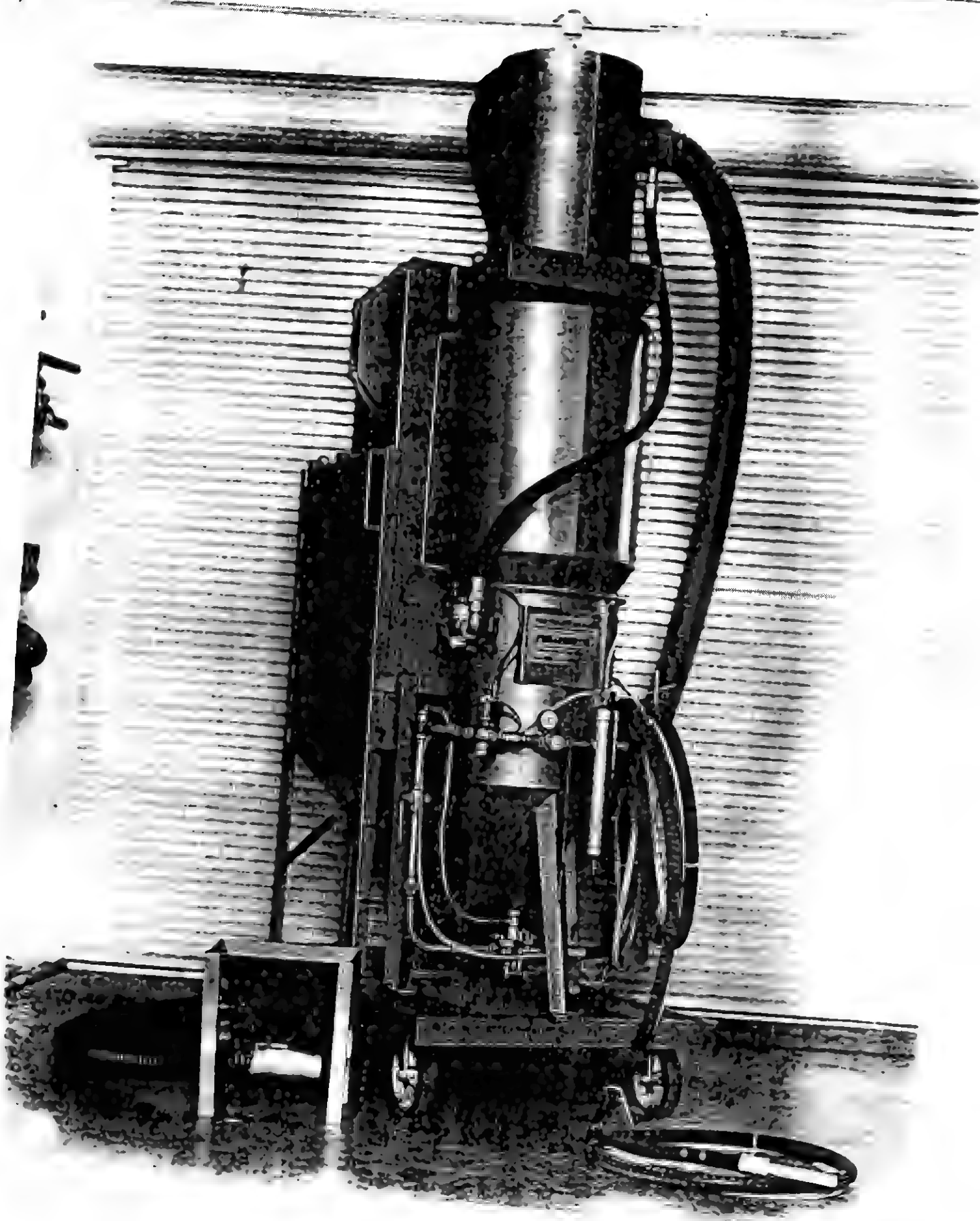
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## REVISION RECORD

NOTE: The PRAM™ 21 machine is a portable reclaiming Dry Stripping Machine. It consists of a PRAM 11 Dry Stripping Machine combined with a reclaimer. Consequently the PRAM 11 Manual in its entirety is a part of this PRAM 21 Manual.

The latest version of this manual is dated August 15, 1985 and consists of:

<u>PAGE #</u>	<u>DATED</u>	<u>DESCRIPTION</u>
1	8/15/85	Cover Sheet
2	8/15/85	Photograph
3	8/15/85	Revision Record
4	8/15/85	Contents
5	8/15/85	Introduction
6	8/15/85	Introduction
7	8/15/85	Introduction
8	8/15/85	Specifications
9	8/15/85	Specifications
10	8/15/85	Applications
11	8/15/85	Applications
12	8/15/85	Assembly and Hook-up
13	8/15/85	Assembly and Hook-up
14	8/15/85	Assembly and Hook-up
15	8/15/85	Operation
16	8/15/85	Operation
17	8/15/85	Maintenance
18	8/15/85	Trouble Shooting

## CONTENTS

- 1.0 INTRODUCTION
- 2.0 SPECIFICATIONS
- 3.0 APPLICATIONS - SEE PRAM 11 MANUAL
- 4.0 ASSEMBLY - INSTALLATION
- 5.0 OPERATION
- 6.0 MAINTENANCE
- 7.0 TROUBLE-SHOOTING
- 8.0 REPLACEMENT PARTS
  - 8.1 DRAWING D-70251 PRAM 21 ASSEMBLY
- 9.0 APPENDIX
  - 9.1 PRAM 11 MANUAL

- 1.0 INTRODUCTION: This manual is intended to provide the user with information necessary to operate and maintain a Pauli & Griffin PRAM™ 21 (Plastic Reclaimable Abrasive Machine - Model 21). Pauli & Griffin PRAM machines have been designed and engineered for high production dry stripping with plastic blast media.
- 1.1 SYSTEM DESCRIPTION: Pauli & Griffin PRAM 21 is a portable Dry Stripping and Reclaiming Machine consisting of a fully accessorized PRAM 11 Dry Stripping Machine; and a triple reclaimer with an easily adjustable air wash, vibrating screen 840 CFM cyclone separator and 1000 pound storage hopper; 840 CFM dust collector powered by 7 1/2 HP, TEFC, 220/440 volt, 3 PH motor/blower.
- 1.2 DETAILED DESCRIPTION: PRAM 11: ASME coded pressure vessel with 60 degree conical bottom; special laminar flow media/air mixing valve with fluidizing section; 65 feet 1-1/4 inch ID by 1-7/8 inch OD PRAM Superflex hose with quick couplings each end; 1/2 inch orifice Super Venturi tungsten carbide nozzle, with coupling nozzle holder, PRAM 150 Remote Control System, plus specialized air inlet manifold assembly; Specialized components include:
- 1.2.1 MOISTURE SEPARATOR: Removes moisture from incoming compressed air. NOTE: Oil or moisture will cause media to clump, clogging metering valve, and causing erratic performance.
- 1.2.2 INLET VALVE: RCV-150 (#371-000) is a normally closed valve which is opened by control line pressure when FEATHERTOUCH valve is depressed. The valve features a remote shut-down petcock as an added safety feature which allows supervisors to deactivate the machine's FEATHERTOUCH system. Petcock is located on top of inlet valve.
- 1.2.3 PRESSURE REGULATOR: Air pressure regulator with gauge allows setting blast pressure to recommended psig range for controllability and repeatability. Operator should use a P & G #977-000 Hypodermic Needle Gauge in order to read and set nozzle pressure.
- 1.2.4 EXHAUST VALVE: #433-000 diaphragm valve is a normally open valve which is closed by control line pressure when FEATHERTOUCH valve is depressed.

- 1.2.5 FEATHERTOUCH VALVE: Non-bleeding remote control valve activates blast ON/OFF at the nozzle. Includes manual safety lock feature.
- 1.2.6 MEDIA METERING VALVE: Adjustable metering valve with straight through flow and horizontal stainless steel discs allows precise control of air/media ratio. A fluidizing section provides optimum flow of the light, plastic media. A mixing tee for introducing blast media to the air stream is incorporated in this valve.
- 1.2.7. MEDIA FILLER VALVE: Rubber covered metal pop-up valve has full 2" ID stem for fast pressurization of machine when FEATHERTOUCH valve is depressed. A #175-004S abrasive diverter is installed to allow the pop-up filler valve to operate freely under the "head pressure" caused by media in overhead hopper.
- 1.2.8 HOSE RACK: Media blast hose storage rack located on hand hole access crab stud.
- 1.3 CYCLONE/AIR WASH/VIBRATING SCREEN RECLAIMER: 850 CFM cyclone/reclaimer designed for optimum efficiency with the 50-60 pound per cubic foot density of plastic media. Specific features include:
- 1.3.1 Fine tunable, two stage air wash system.
- 1.3.2. Vibrating screen to trap debris and oversized particles.
- 1.3.3 1000 pound capacity media storage hopper below screen and over pressure vessel for automatic refill of machine each time blasting stops. Machine capacity is 337 pounds. Total usable capacity, hopper plus machine equals 1330 pounds.
- 1.3.4. Media pick up hopper with 25 feet of 5" ID conveying hose. Hopper is designed to flow 105 pounds per minute to reclaimer, (6400 pounds per hour). Lo Profile pickup station optional at additional cost.
- 1.4 DUST COLLECTOR: 850 CFM Dust Collector all electric welded steel housing with the following features:



- 1.4.1 TEFC 7 1/2 HP, 60 HZ, 3 PH, 208-230/460 volt motor with high static blower (30-32 inches water column).  
(Other voltages and 50 HZ also available)
- 1.4.2 Thirty high efficiency tubular dust bags with 14 feet (13m<sup>2</sup>) filter area.
- 1.4.3 Manual bag shaker for periodic bag cleaning is standard; Automatic bag shaker/timer available as an option at additional cost.
- 1.4.4 Sealed hinged access door for bag maintenance.
- 1.4.5 Quick opening dust storage hopper.
- 1.5 CHASSIS: Steel channel frame with swivel casters and tow bar one end and rigid caster wheels opposite end.

2.0 SPECIFICATIONS:

2.1 GENERAL:

OVERALL DIMENSIONS:

13.4 ft.  
100" long x 48" wide x 161" high  
(254cm x 122cm x 409cm)

WEIGHT:

2500 pounds (1000 kg)

AIR REQUIREMENT:

220 CFM @ 100 psi  
(6 m3/min. @ 7 kg/cm2)

ELECTRICAL REQUIREMENT:

208-230/460 volt, 3 PH,  
4 wire, 60 HZ  
(Other voltages and 50 HZ also  
available)

MOTOR STARTER:

Included

TOTAL MEDIA CAPACITY:

1330 pounds (605 kg)

MEDIA CONSUMPTION/HOUR:

1/2" nozzle: 800 lbs/hr normal,  
400 lbs/hr lean (364 & 182 kg/hr)

3/8" nozzle: 450 lbs/hr normal,  
225 lbs/hr lean (205 & 102 kg/hr)

TOTAL NOZZLE HOURS PER  
1330 POUND CHARGE:

1/2" nozzle: 1 hour 40 minutes  
normal, 3 hours 20 minutes lean

3/8" nozzle: 2 hours 57 minutes  
normal, 5 hours 55 minutes lean

MEDIA RECLAIMING RATE:

6400 lbs/hour (2900 kg 1 hour)

CHASSIS:

Heavy duty steel channel frame, with  
12" rubber tire steel wheels - two  
fixed and two castoring; tow bar with  
3" ID, 5-1/2" OD eye.  
MAX TOW SPEED IS 5 MILES PER HR.

2.2 PRAM™ 11 MACHINE:

The PRAM 11 Dry Stripping Machine is the media delivery device and is described in detail in the attached PRAM 11 Operating Manual.

2.3 CYCLONE/AIR WASH/VIBRATING SCREEN RECLAIMER:

HOPPER CAPACITY: 1000 pounds (455 kg)

DIMENSIONS: 83 1/2" high (212cm) x 30" wide x 30" deep (76cm)

PICK UP HOPPER: 24" wide x 24" deep x 24" high (61cm x 61cm x 61cm)

CONVEYING HOSE: 25' x 5" ID (7.6cm x 13cm)

2.4 DUST COLLECTOR:

DIMENSIONS: 36" wide x 36" deep x 124" high (92cm x 92cm x 315cm)

MOTOR: 7-1/2 HP, 208-230/480 volt, 3 phrase 60 HZ, TEFC motor with 1.15 service factor

BLOWER: High static (30-32N) at 850-900 CFM

FILTER AREA: 30 dust bags with 140 square feet filter area (13 square meters)

2.5 OPTIONAL EQUIPMENT, at additional cost

2.5.1 See PRAM 11 Manual, Section 2.1, for Dry Stripping accessories.

2.5.2. Reclaiming accessories: Lo Profile media pick up station with screen section. A smaller version of the highly successful Republic Airlines pick up station, the Lo Profile unit allows sweep-to, push-to, reclaiming with a negligible height above floor. This will speed your reclaim time and is the next best thing to a reclaiming floor.

### 3.0 APPLICATIONS:

#### EXAMPLES OF USE

<u>ITEM</u>	<u>MEDIA TYPE</u>	<u>COMMENTS</u>
AUTO BODIES Fiberglass, sheet metal	POLYEXTRA POLYPLUS	Most paint can be blasted off without need to mask glass, rubber or chrome surfaces
MILITARY AIRCRAFT Aluminum, magnesium, titanium, fiberglass, carbon/graphite composite	POLYEXTRA POLYPLUS TYPE 111	Used to remove most surface coatings & build up without damage to substrate. Replacement for toxic chemical solvents
TIRE MOLDS Aluminum, steel	TYPE 111 40 psi 30/40	Able to remove surface build up without damaging mold surface
HELICOPTER COMPONENTS Carbon/graphite	TYPE 111 30 psi 30/40	Removes polyurethane paint without marring or removing composite substrate
AIRCRAFT NOSE CONES RADOMES Fiberglass	POLYEXTRA 30 psi 20/30	Removes polyurethane paint down to surface with no damage to fiberglass
AIRCRAFT LANDING GEAR Heat treated steel	POLYPLUS 50 psi 16/20	Able to remove surface coatings down to anodize without removing anodize

AIRCRAFT ENGINE COMPONENTS	POLYPLUS 40 psi	Used to debur critical components while maintaining .040 tolerance. Remove ceramic coatings and rubber sealants
Aluminum, exotic metals	20/30	
SURFACE SEALANTS	TYPE 111	Readily removes various sealants with no damage to substrates
Polysulfide, teflon dry file	50 psi 16/20	

\*Recommended pressures are based on our experience with certain parts. Type of coating, thickness of coating, thickness and type of substrate and nozzle angle and distance must be considered before establishing criteria for your particular job.

4.0 ASSEMBLY AND HOOK UP INSTRUCTIONS - Refer to Drawing D-70251

- 4.1 Unit will arrive in sections on pallets. Remove each unit from pallet. Attach tow bar to front of cart.
- 4.2 Set dust collector on front end (toward tow bar) with door on left side when holding tow bar in your hands and facing cart. Bolt in place.
- 4.3 Mount plenum on rear top of collector with sleeve facing forward. Be sure that double strip gasket on collector is intact before mounting. Bolt in place.
- 4.4 Mount motor-blower on top of collector forward of silencer, slipping sleeve on blower inside of sleeve on plenum. Bolt in place.
- 4.5 Mount Dry Stripping Machine on rear of cart with name plate facing towards rear. Bolt in place.
- 4.6 Mount cyclone separator-hopper assembly on top of Dry Stripping Machine with hinged clean-out door facing forward (toward dust collector), using gasket provided (plus sealant if necessary). Bolt ring on hopper to ring on Dry Stripping Machine to achieve a air tight seal. This seal is vital if reclaimer is to operate properly.

NOTE: Be certain concave head on PRAM 11 is clean, free of debris and pop up valve is free.

- 4.7 Connect black 75 inch long hose to (No. 14) bottom of cyclone separator inlet and to quick coupling on exhaust valve (No.33) on Dry Stripping Machine. Safety wire couplings to prevent accidental uncoupling.
- 4.8 Connect yellow air line with 1/4 inch swivel fitting on cyclone separator (No. 20) to needle valve (No. 26) on top of moisture separator (No. 31).
- 4.9 Connect yellow and gray Poly Air Cable (No. 39) remote control hose to yellow and gray hose at botttom of Dry Stripping Machine near blast hose connection. Use 1/4 inch x 1/4 inch x 1/8 inch x 1/8 inch double-male fittings supplied with PAC hose.

- 4.10 Connect PRAM Stripping Machine
- 4.11 Screw nozzle (No. 37) into holder (No. 40) at other end of blast hose. Hand tighten only.
- 4.12 Strap FEATHERTOUCH DEADMAN VALVE (No. 38) to blast hose near nozzle. Connect yellow section of PAC hose to 1/4 inch fitting on FEATHERTOUCH. Connect gray PAC hose to 1/8 inch fitting on FEATHERTOUCH remote control. Determine if safety lock is "ON" so handle cannot be depressed.
- 4.13 Connect 6 inch ID x 12 1/2 foot long to vacuum hose (No.11) to outlet of cyclone separator. The outlet is the topmost connection, facing forward. Fasten hose clamp (No. 23), and attach other end at bottom of dust collector. Tighten hose clamp (No. 23).
- 4.14 Attach (No. 12), 5 inch ID x 25 foot long, vacuum hose to cyclone inlet. Clamp in place (No. 24). Attach other end to pick up hopper or optional Lo Profile Floor Pick up Station.
- 4.15 Wire 7 1/2 HP, 208-230/480, 3 phase, 60 cycle, TEFC blower motor. Have qualified electrician wire for appropriate voltage in accordance with manufacturer's name plate instruction.
- CAUTION:** Motor is factory wired for 230 volts. If connected to 460 Volts, heaters in starter must be replaced, holding coil wiring in starter and wiring connections in motor must be changed.
- 4.16 Connect power to motor starter (No. 2):
- 4.17 Connect customer supplied air inlet fitting to PRAM machine air inlet at moisture separator or at optional tee and valve assembly if installed.

- 4.18 Start air compressor and bring up to working pressure. In order to eliminate accumulated water, oil and debris, purge receiving tank and supply hose prior to connecting supply hose to PRAM Machine. Moisture in the air supply tank or hose will adversely affect media flow and blasting performance. In a new installation, blow air line for several minutes.
- 4.19 Connect minimum 1-1/2 inch ID air hose or pipe to PRAM 11 Machine air inlet at moisture separator. This is to be supplied by customer.
- 4.20 To charge system: Locate pick up hopper near media source. Turn dust collector motor on. Slowly pour media into hopper to be conveyed to reclaimer. System can accomodate approximately 1300 pounds of media.
- 4.21 Connect operator safety equipment. See PRAM 11 Manual, attached pages 10 and 11, Section 2.1, for complete options list.
- 4.22 You are now ready to Dry Strip. Be certain all operators and observers are protected.

CAUTION: THIS PROCESS IS OPERATOR AND SUBSTRATE SENSITIVE. OPERATOR TRAINING IS ESSENTIAL TO PREVENT OPERATOR AND OBSERVER INJURY AND SUBSTRATE DAMAGE. WE STRONGLY RECOMMEND PAULI & GRIFFIN COMPANY'S OPERATOR TRAINING PROGRAM BE UTILIZED.



## 5.0 OPERATION:

- 5.0.1 Assure that all personnel in the vicinity are fitted with MSHA/NIOSH approved supplied air respirators, such as P & G Model 907.
- 5.0.2 Start air compressor and bring up to operating temperature and pressure; purge receiver tank and supply line each time compressor is started up.
- 5.0.3 For initial installation/start up, close M-70 media metering valve completely. With nozzle in blasting position (and away from personnel depress FEATHERTOUCH valve and slowly open M-70 valve until media is just barely visible as a haze at the end of the nozzle. After initial air/media ratio setting, check mixture periodically and adjust as required. Note that changing media size will require readjustment of media metering valve.
- 5.0.4 With nozzle still in blasting position, insert hypodermic needle gauge into PRAM hose, behind nozzle and coupling, angled in the direction of air/media flow, with needle orifice facing up. With FEATHERTOUCH valve depressed, read pressure and adjust to recommended setting at air pressure regulator mounted on PRAM machine. Remove needle gauge as soon as desired nozzle pressure is achieved. Recheck every 4 hours minimum or sooner if a change in reaction thrust occurs at nozzle.
- 5.1 MEDIA RECLAIMING: Reclaiming can be accomplished during or after dry stripping operation.
  - 5.1.1 Assure that media recovery personnel working during dry stripping operation are fitted with MSHA/NIOSH approved supplied air respirator and hearing protection.
  - 5.1.2 Open needle valve located in brass tee on moisture separator one turn. Close needle valve when recovery is completed. This step is to eliminate noise from vibrating screen and is optional.
  - 5.1.3 Turn vacuum motor "ON" at motor starter.

5.1.4 Set pick up hopper at desired locations.

5.1.5 With scrapper or broom, push media to a pile and shovel into hopper to be pneumatically conveyed to cyclone reclaimer. Use of optional Lo Profile station speeds the process because of it's low four inch height.

## 6.0 MAINTENANCE:

- 6.0.1 Remove cleanout plug on M-70 metering valve (No. 35) and check for any obstructions. Clean magnet of any metal fragments.
- 6.0.2 Open petcock on moisture separator (No. 31) at machine inlet and allow to drain completely. Note that petcock has been modified to continuously drain. It cannot be completely shut off.
- 6.0.3 Drain air receiver tank of compressor used to supply the PRAM machine and all drainable low points in compressed air supply system.
- 6.0.4 Shut reclaimer motor down and thoroughly shake dust bags; place container under housing and open dump gate to empty.
- 6.0.5 Open dust collector access door and inspect for dust in clean area of dust collector. If any found, carefully inspect bags (No. 6) to locate leak. Replace bags or seal the bag to plate connection as required.
- 6.0.6 Open access door at cyclone and remove any debris from screen.

## 6.1 WEEKLY MAINTENANCE

Perform all daily maintenance functions in addition to the following:

- 6.1.1 Inspect all hoses and control lines for leaks or wear; replace as required.
- 6.1.2 Remove supply line to aeration device (No. 41) and inspect for blockage or leaks. Repair or replace as required.

## 7.0 TROUBLE SHOOTING

7.1 Trouble shooting PRAM 11 machine for media delivery, or lack of problems, See attached PRAM 11 Manual, Section 7.1, page 21.

## 7.2 RECLAIMER WILL NOT CONVEY MEDIA

- |   |  |
|---|--|
| a) Blower rotating wrong direction                    | i) Electrician to change two (2) incoming power supply lines to motor              |
| b) Pick up hopper plugged                             | i) Clear blockage  |
| c) Leak or blockage in vacuum hose                    | i) Inspect hose for vacuum leak or blockage. Repair or replace as required         |
| d) Storage hopper screen door leak, or screen clogged | i) Install new door seal. Clean screen.  |
| e) Dust collector door leak                           | i) Install new dust collector door seal. Check bottom discharge seal.              |
| f) Leak at PRAM 11 reclaimer flange                   | i) Install new seal on pot/reclaimer flange  |
| g) Dust bags dirty                                    | i) Remove and thoroughly shake or install new dust bags. Do not launder dust bags. |

## 7.3 EXCESS REUSABLE MEDIA CARRIED OVER TO DUST COLLECTION SYSTEM:

- a) Improper adjustment of air wash system
- i) Close four air wash slide gates (No. 28) at cyclone. Gradually open to increase amount of dust carried over, just until desired amount of carry over is achieved.
  - ii) With system shut down, open access door to cyclone (No. 10) and loosen inner cone retaining nut. Raise cone and retighten retaining nut.

- iii) Vibrating screen in reclaimer, (No. 3 on print D-70251, next page) may be clogged, causing media to build up to such a height that it is sucked into the center tube of the cyclone, immediately above the screen.
- iv) Machine may be overfilled causing similar symptom, see paragraph ( iii ) above. Total machine capacity (standard version) is 1330 pounds of plastic media (330 in pressure vessel, 1000 pounds in hopper.
- v) Check to see vibrator is operating.

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## PAULI & GRIFFIN

PRAM™ 31 PLASTIC MEDIA BLAST  
PRESSURE CABINET

OPERATIONS MANUAL

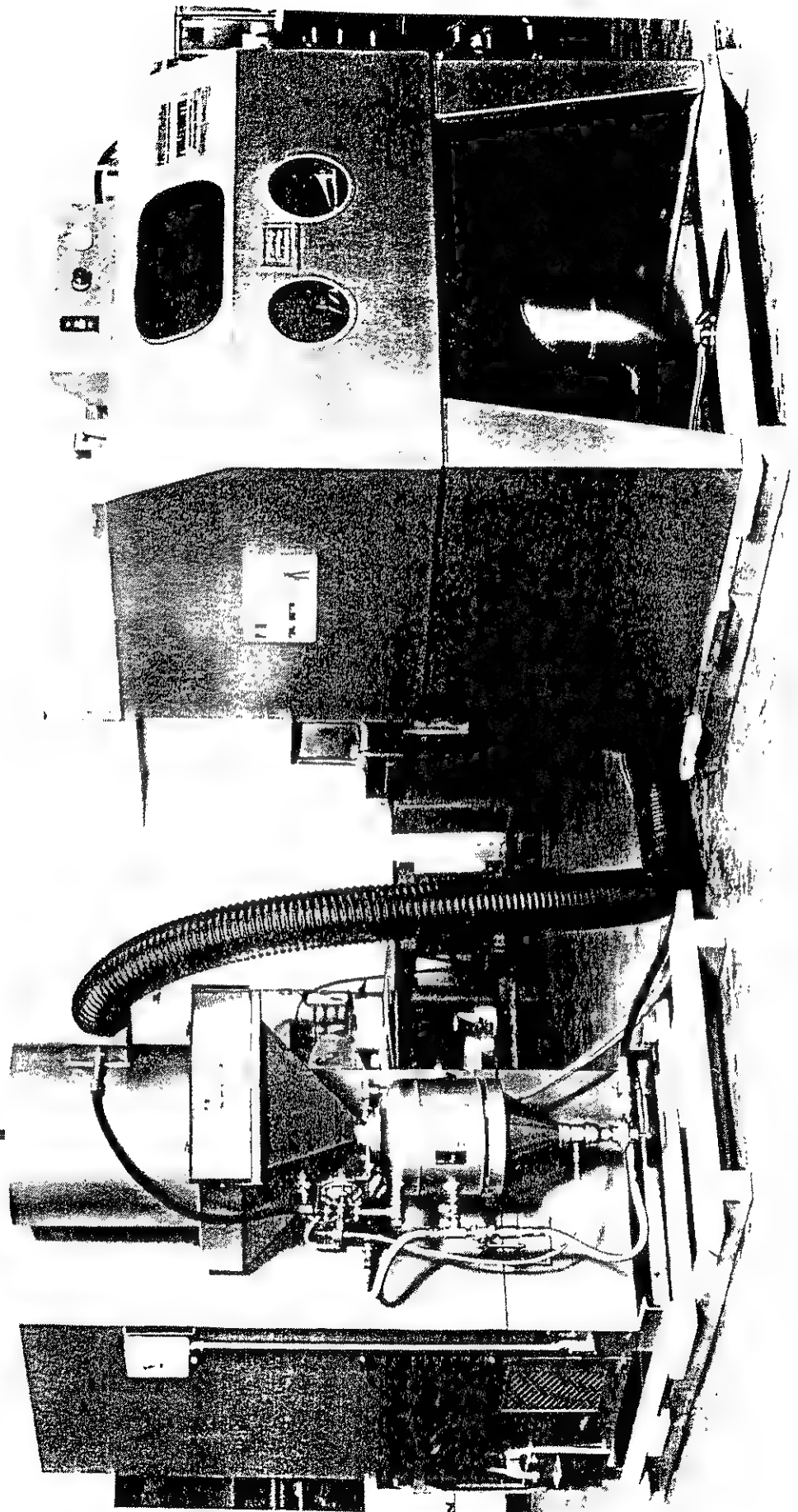
APPLICATIONS  
INSTALLATION  
OPERATION  
MAINTENANCE  
TROUBLE SHOOTING  
REPLACEMENT PARTS

*systems*  
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## REVISION RECORD

The latest version of this manual is dated January 15, 1986 and consists of:

<u>PAGE #</u>	<u>DATED</u>	<u>DESCRIPTION</u>
1	1/15/86	Cover Sheet
2	1/15/86	Photograph
3	1/15/86	Revision Record
4	1/15/86	Contents
5	1/15/86	Note
6	1/15/86	Introduction
7	1/15/86	Introduction
8	1/15/86	Introduction
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20	1/15/86	Trouble Shooting
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22	1/15/86	Trouble Shooting
23	1/15/86	Replacement Parts
24	1/15/86	Drwg. D-70245
25	1/15/86	Drwg. D-70246
26	1/15/86	Air Inlet Valve
27	1/15/86	FEATHERTOUCH® Remote Control
28	1/15/86	Poly Air Cable
29	1/15/86	M-15 Valve



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- 2.0 SPECIFICATIONS
- 3.0 APPLICATIONS
- 4.0 INSTALLATION/START UP
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- 6.0 MAINTENANCE
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- 8.0 REPLACEMENT PARTS - COMPONENT DIAGRAMS
  - 8.1 RECOMMENDED SPARE PARTS
  - 8.2 DRWG. 70245
  - 8.3 DRWG. 70246
  - 8.4 AIR INLET VALVE (RCV-150 #371-000)
  - 8.5 FEATHERTOUCH® REMOTE CONTROL (LO PROFILE)
  - 8.6 POLY AIR CABLE
  - 8.7 M-15 VALVE

NOTE: Machines manufactured prior to December 9, 1985 had an air pressure gauge on the instrument panel connected to a needle inserted in the blast hose at the upper cabinet entrance. This was changed after December 9, 1985 to read the pressure back at the pressure blast generator mounted on the dust collector unit. In order to conveniently measure nozzle pressure, a hand needle gauge has been included with each PRAM 31. The operator is to take his hand needle gauge, insert it in the hose at the upper cabinet entrance, and make a calibration card to relate the air pressure on the instrument panel dial to the actual air pressure on the needle gauge. This will have to be done for both the 1/2" hose, 1/4" nozzle combination and the 3/4" hose, 3/8" nozzle combination supplied with the PRAM 31.

- 1.0 INTRODUCTION: This manual contains information on the operation and maintenance of the Pauli & Griffin PRAM™ 31 Direct Pressure Plastic Media Blast Cabinet.
- 1.1 DESCRIPTION: The PRAM 31 consists of a cabinet with large, sealed blast area, an ASME coded pressure vessel with a 60 degree conical bottom; an 840 CFM cyclone reclaimer and an 840 CFM dust collector. The entire system has been designed specifically for blasting and reclaiming plastic media.
- 1.2 BLAST CABINET FEATURES:
  - 1.2.1 Blasting chamber cabinet with 60" wide by 48" deep by 36" high work area; sealed 10" by 22" safety glass view window; three 150 watt flood lights; arm holes with gloves and gauntlets; expanded metal work deck.
  - 1.2.2 PTMV 6 3/8" orifice tungsten carbide nozzle plus 20' of 3/4" blast hose, coupled; (PTX 4 1/4" orifice slip-on Venturi Nozzle, plus 20' of 1/2" blast hose, coupled). Foot control for blast ON/OFF.
  - 1.2.3 Manually operated blow-off gun.
  - 1.2.4 Top mounted control panel with interior illumination light ON/OFF switch and remote blasting air pressure regulator and gauge.
  - 1.2.5 Right hand hinged door standard; counterbalanced door optional.
- 1.3 RECLAIMING SECTION/PRAM PRESSURE VESSEL:
  - 1.3.1 840 CFM cyclone reclaimer with adjustable two-stage air wash for optimum cleaning/reclaiming of plastic media.
  - 1.3.2 Vibrating screen mounted beneath cyclone/air wash and above storage hopper.
  - 1.3.3 One cubic foot ASME coded pressure vessel with 60 degree conical bottom and media fluidizing section.
  - 1.3.4 Pressure vessel air inlet fitted with moisture separator/fine

particle filter, remote control inlet valve, air pressure regulator (controlled at blast cabinet), and pinch exhaust valve.

1.4 840 CFM DUST COLLECTOR:

- 1.4.1 Steel bag housing with 30 tubular dust bags with 140 square feet of filter area.
- 1.4.2 2 HP, 208-230/460 volt, 3 phase, 60 HZ motor blower assembly. 230 V motor starter and switch supplied standard.
- 1.4.3 Manual bag shaker provided for periodic bag cleaning; large capacity dust drawer for easy dust disposal.

1.5 PRINCIPLE OF OPERATION:

- 1.5.1 Surface cleaning is accomplished by a stream of media suspended in and propelled by a high velocity air stream which is directed through a nozzle at a work piece inside the blast cabinet.
- 1.5.2 After striking the work surface, media and debris fall through an expanded metal work deck into the bottom of a tapered cabinet hopper. All media, dust and debris are pneumatically conveyed to reclaiming section for cleaning and reclaiming.
- 1.5.3 Inside the reclaiming system, the cyclone separator centrifugally spirals the dust and debris, throwing good media and heavier particles to the outer walls, where they spiral down to the vibrating screen. Lighter particles and "fines" are drawn to the center of the cyclone and conveyed to the dust collector.
- 1.5.4 A two-stage, fine tunable air wash system in the cyclone enhances the separation of dust and other fines from the reusable media.

- 1.5.5 The vibrating screen allows correctly sized, reusable media to pass through to the hopper where it will be stored for reuse. Larger debris is caught on top on the screen for later removal through a latched door.
- 1.5.6 Each time blasting is stopped, the pressure vessel automatically exhausts and is refilled with the reclaimed media.

## 2.0 SPECIFICATIONS:

### 2.1 BLAST CABINET:

Overall Dimensions:	75" high x 60" wide x 60" deep (191 cm x 152 cm x 152 cm)
Work Area:	36" high x 60" wide x 48" deep (91 cm x 152 cm x 122 cm)
Hinged Door Opening:	31" high x 42" wide (70 cm x 100 cm)
Counter Balanced Door Opening (opt.)	29" high x 43" wide (74 cm x 109 cm)

NOTE: Reduce allowable work piece to height by 7" (18 cm) when optional workcar and turntable are used.

### 2.2 CYCLONE RECLAIMER::

Overall Dimensions: (Includes pressure vessel):	85" high x 39" wide x 39" deep (216 cm x 99 cm x 99 cm)
---	--

### 2.3 PRESSURE VESSEL:

Capacity:	1 cubic foot (.03 m <sup>3</sup> ) ASME coded, with 60 degree cone and fluidizing section
-----------	--

### 2.4 DUST COLLECTOR:

Overall Dimensions:	85" high x 39" wide x 87" deep (216 cm x 99 cm x 221 cm)
Tubular Dust Bags:	30; 140 sq. ft. (13 m <sup>2</sup> ) filter area
Motor:	2 HP, 60 HZ, 3 PH, 230/460 V
Ventilation Rate:	840 CFM (23.8 m <sup>3</sup> /min.)

## 2.5 NOZZLE:

2.5.1 3/8" (10 mm) PTMV-6 tungsten carbide Venturi Nozzle with 20' (6.1 m) of 3/4" (19 mm) media hose with PHE-1 Nozzle Holder and CQ-1 quick coupling (standard).

2.5.2 1/4" (6 mm) slip-on tungsten carbide Venturi Nozzle with 20' (6.1 m) of 1.2" (13 mm) ID media hose with CQ-1/2 L other end (optional).

## 2.6 PRESSURE VESSEL VALVES/ACCESSORIES:

Moisture Separator: 1" (25 mm) continuous drain

Air Pressure Regulator: 1" (25 mm) installed at pressure vessel inlet

Remote Regulator/Gauge: Installed at cabinet panel

Media/Air Mixing: Fluidized bed, M-15 metering valve

## 2.7 AIR CONSUMPTION:

Vibrating Screen: 3 CFM @ 100 psi

Fluidizing Section: 1 CFM @ 40 psi

PTMV-6 Nozzle: 80 CFM @ 40 psi  
122 CFM @ 60 psi

PTX-4 Nozzle: 36 CFM @ 40 psi  
54 CFM @ 60 psi

## 2.8 MEDIA CONSUMPTION:

3/8" Nozzle 300 lbs/hour

1/4" Nozzle 150 lbs/hour

2.9 OPTIONAL EQUIPMENT:

- 2.9.1 Base-mounted turntable
- 2.9.2 Work car with inside track
- 2.9.3 30" turntable for work car
- 2.9.4 Outside track extension
- 2.9.5 Counter balanced door, 29" (74 cm) high by 43" deep opening allows passage of work car/turntable.
- 2.9.6 Automatic bag shaker cleans dust for a preset interval each time dust collector motor blower is turned off.
- 2.9.7 Fixed, adjustable nozzle holder.

NOTE: Additional components or design modifications can be custom designed for special applications, such as multiple nozzle systems and nozzle oscillation systems. Contact Manager of Engineering, Aeronautical Products Division, for more information.



### 3.0 APPLICATIONS

#### EXAMPLES OF USE

	<u>POLY EXTRA</u>	<u>POLY PLUS</u>	<u>TYPE 111</u>
<u>ITEM</u>	<u>MEDIA TYPE</u>	<u>COMENTS</u>	
AUTO BODIES Fiberglass, sheet metal	POLYEXTRA POLYPLUS	Most paint can be blasted off without need to mask rubber surfaces	
MILITARY AIRCRAFT Aluminum, magnesium, titanium, fiberglass, carbon/graphite composite	POLYEXTRA POLYPLUS TYPE 111	Used to remove most surface coatings & build up without damage to substrate. Replace- ment for toxic chemical solvents	
TIRE MOLDS Aluminum, steel	POLYPLUS 40 psi 30/40	Able to remove surface build up without damaging mold surface	
HELICOPTER COMPONENTS Carbon/graphite	POLYPLUS 30 psi 30/40	Removes polyurethane paint without marring or removing composite substrate	
AIRCRAFT NOSE CONES RADOMES Fiberglass	POLYEXTRA 30 psi 20/30	Removes polyurethane paint down to surface with no damage to fiberglass	
AIRCRAFT LANDING GEAR Heat treated steel	POLYPLUS 50 psi 16/20	Able to remove surface coatings down to anodize without removing anodize	

<u>ITEM</u>	<u>MEDIA TYPE</u>	<u>COMMENTS</u>
AIRCRAFT ENGINE COMPONENTS Aluminum, exotic metals	POLYPLUS 40 psi 20/30	Used to deburr critical components while maintaining .040 tolerance. Remove ceramic coatings and rubber sealants
SURFACE SEALANTS Polysulfide, teflon dry file	TYPE 111 50 psi 16/20	Readily removes various sealants with no damage to substrates

\* Recommended pressures are based on our experience with certain parts. Type of coating, thickness of coating, thickness and type of substrate and nozzle angle and distance must be considered before establishing criteria for your particular job.

#### 4.0 INSTALLATION/START-UP:

Reference numbers refer to Drawings Section 8.2 and 8.3; an "a" suffix indicates Drawing D-70245 (cabinet), a "b" suffix indicates Drawing D-70246 (dust collector).

- 4.1 Place cabinet in desired location.
- 4.2 Position dust collector/reclaimer behind cabinet, preferably with reclaimer inlet directly facing the cabinet hopper outlet (so that conveying hose has no bends).

NOTE: Assure that bag access door and dust drawer can be reached for maintenance.

- 4.3 Connect 6" vacuum hose to reclaimer inlet (21b) and to bottom of hopper (2a) on cabinet. Secure hose with clamps.
- 4.4 Connect quick coupling end of 3/4" blast hose (23b) to feed valve connection on bottom of pressure vessel (8b). Run the nozzle end of the blast hose (38a) up back side of cabinet and through the rubber diaphragm on top of cabinet (41a). Screw nozzle into threaded nozzle holder on end of blast hose.
- 4.5 Connect yellow line of Poly Air Cable (28b) from hexagonal brass manifold (36b) near air inlet to tee on pilot regulator (5a), (mounted on cabinet control panel).
- 4.6 Connect gray line of Poly Air Cable (28b) from operator regulator (4b), (near air inlet) to bottom outlet of pilot regulator (5a).
- 4.7 Connect motor starter (37b) to 230/460, 3 phase power source.

CAUTION: Motor is factory wired for 230 V. If connected to 460 V, heaters in starter must be replaced and wiring connections in motor must be changed.

- 4.8 Plug cabinet lights on top of cabinet to 110 V power source.
- 4.9 Connect 1" minimum air supply line to inlet tee on dust collector. (AIR-IN indication D-70246).
- 4.10 Remove 4" x 5" inspection plate (38b) on dust collector. Start motor

and check that rotation is counter clockwise as viewed through inspection hole. If rotation is not correct, swap terminals on any two of the three wires in motor starter, after disconnecting motor from electrical source to prevent accidental injury. Start motor and recheck rotation.

4.11 Replace inspection plate.

4.12 With motor on, pour up to 50 pounds of media into cabinet hopper; media will be conveyed to pressure vessel.

## 5.0 OPERATING INSTRUCTIONS:

Reference numbers refer to Drawings in SectionS 8.2 AND 8.3; an "a" suffix refers to Drawing D-70245 (cabinet), a "b" suffix refers to drawing D-70246 (dust collector).

- 5.1 Start dust collector motor (37b).
- 5.2 Turn on the compressed air supply. (Vibrating screen in hopper will activate).
- 5.3 Turn on the cabinet lights (9a).
- 5.4 Adjust media flow rate as follows: Grasp nozzle (4a) through hand holes and hold so that blast stream will be visible. Depress foot valve (23a) and observe media flow at end of nozzle. Close M-15 (27b); slowly open until media is just visible as a haze at end of nozzle.
- 5.5 With nozzle in same position, depress foot valve (23a) and check pressure gauge (6a) on cabinet panel. Adjust regulator knob (5a) as desired to achieve desired pressure.

**NOTE:** Pressure regulator operator (4b) is installed at blast machine inlet, up stream of pressure loss. It is recommended that nozzle pressure be verified by inserting hypodermic needle gauge into PRAM hose, behind nozzle and coupling, angled in the direction of air/media flow with needle orifice facing away from flow. With foot valve depressed read pressure and adjust with pressure panel mounted regulator. Remove needle gauge as soon as desired nozzle pressure is achieved to reduce wear and prolong needle life. (Production rate drops sharply below 40 psi at the nozzle; media break down increases sharply above 60 psi).

**NOTE:** Machines manufactured prior to December 9, 1985 had an air pressure gauge on the instrument panel connected to a needle inserted in the blast hose at the upper cabinet entrance. This was changed after December 9, 1985 to read the pressure back at the pressure blast generator mounted on the dust collector unit. In order to conveniently measure nozzle pressure, a hand needle gauge has been included with each PRAM 31. The operator is to take his hand needle gauge, insert it in the hose at the upper cabinet entrance, and make a calibration card to relate the air pressure on the instrument

panel dial to the actual air pressure on the needle gauge. This will have to be done for both the 1/2" hose, 1/4" nozzle combination and the 3/4" hose, 3/8" nozzle combination supplied with the PRAM 31.

- 5.6 Open cabinet door and load work piece in cabinet. Close and secure door.
- 5.7 Grasp nozzle through hand holes and direct at work piece. Hold at approximately 75 degree angle to work piece, and 12-14" away. Increasing distance between nozzle and work piece will increase blast pattern area and lower impact velocity of media.

## 6.0 MAINTENANCE:

Reference numbers refer to Drawings in Sections 8.2 and 8.3; an "a" suffix indicates D-70245 (cabinet; a "b" suffix indicates D-70246 (dust collector)

### 6.1 DAILY MAINTENANCE:

- 6.1.1 Open drain valve on moisture separator (14b) and allow to drain completely.
- 6.2.2 Manually shake dust bags several times using handle on side of dust collector. This should be done at least twice in an eight hour shift. The dust hopper should not be allowed to fill to more than 1/3 capacity. Remove dust drawer and discard dust. For exceptionally heavy use, shake bags every hour.
- 6.1.3 Open access door and inspect for dust in clean area of dust collector. If any found, carefully inspect bags (5b) to locate leak. Replace bags as required.
- 6.1.4 Remove all debris from expanded metal work deck inside cabinet.
- 6.1.5 Open access door at cyclone (19b) and remove any debris from screen.
- 6.1.6 Inspect media for lumps and excessive breakdown. Replace or replenish media as needed.
- 6.1.7 Clean view window (19a) with soft, lint-free cloth.
- 6.1.8 Drain air receiver tank of compressor used to supply the PRAM Blast Cabinet, as well as all drainable low points in compressed air system.

## 6.2 WEEKLY MAINTENANCE:

- 6.2.1 Clean interior and exterior of unit using a soft brush and compressed air.
- 6.2.2 Inspect media hose (38a) for wear, especially at bends. Replace as necessary.
- 6.2.3 Remove filter (25a) from top of cabinet and clean with compressed air.
- 6.2.4 Rotate pinch tube  $1/8$  turn to distribute wear evenly around circumference of tube.



## 7.0 TROUBLE SHOOTING:

### 7.1 NO AIR OR MEDIA FROM NOZZLE:

#### (A) Inlet valve (13b) closed:

- i) Close petcock on top of inlet valve.
- ii) Check for leaks in Poly Air Cable (24b), especially at connections.
- iii) Check air pressure where supply air enters machine.

#### B) Blast hose and/or nozzle clogged:

- i) Close air supply and remove nozzle, clear obstruction.

### 7.2 AIR DISCHARGES FROM NOZZLE, BUT LITTLE OR NO MEDIA:

#### A) No media:

- i) Replenish system with clean, dry media.

#### B) Clogged metering valve (8b).

- i) With nozzle in blast position, and media metering valve fully open depress FEATHERTOUCH valve (22a) and close choke valve (11b) for two seconds. This should clear valve. If still no media feed after 20 seconds, repeat procedure one more time. If not clear after second time, go to step (ii).
- ii) If above fails, shut system down, depressurize machine. Remove clean out plug in metering valve (27b) and remove obstruction.

#### C) Clog in tank:

- i) After depressuring system remove hand hole cover (39b). Remove foreign material, generally lodged at bottom of cone.

### 7.3 ERRATIC OR PULSING MEDIA FLOW:

- A) Incorrect metering valve adjustment:
  - i) Gradually close valve setting until media flows smoothly and is just visible as haze at end of nozzle.
- B) Aeration system blocked:
  - i) Check air supply line (25b) for leaks or blockage; check porous stone (40b) for blockage. (Hand hole cover (39b) must be removed to obtain access to porous stone).
- C) Excess moisture in system, partially clogging valve.
  - i) Use fresh, dry media.
  - ii) With nozzle in blast position, repeat 7.2b and 7.2c.
  - iii) Drain moisture separator (14b).

### 7.4 MACHINE WILL NOT PRESSURIZE:

- A) Air leak in system:
  - i) Check PAC lines (24b), media hose (38a), hand hole (39b) and pop-up valve (41b). Repair or replace as required.
- B) Insufficient air supply (pop-up will not seat or will not stay seated when blasting begins):
  - i) Change to smaller nozzle or obtain compressor of adequate size.

## 7.5 POOR VISIBILITY WHILE BLASTING:

- A) Insufficient air flow due to dirty dust collection system:
  - i) Shut system down and thoroughly clean dust bags per Section 7.1.2.
- B) Intake filter (25a) clogged:
  - i) Remove and thoroughly clean with compressed air.
- C) Media broken down to dust and fines:
  - i) Empty pressure vessel and discard broken down media. Thoroughly clean dust bags (5b) prior to recharging system with clean, dry media.
- D) Blast pressure too great:
  - i) Reduce pressure at pilot regulator (5a). Best range is between 40 psi and 60 psi. At pressures over 60 psi, media breakdown rate increases sharply.

## 7.6 EXCESS REUSABLE MEDIA CARRIED OVER TO DUST COLLECTION SYSTEM:

- A) Improper adjustment of air wash system:
  - i) Close four air wash slide gates (42b) at cyclone hopper. Gradually open to increase amount of dust carried over until desired amount of carry over is achieved.
  - ii) With system shut down, open access door to cyclone (43b) and loosen inner cone retaining nut (44b). Raise cone (45b) and retighten retaining nut. (Generally not necessary - usually 7.6a (i) will correct the problem).
- B) Leak in vacuum system:
  - i) Inspect hoses (21b) and gaskets (2b) on vacuum system. Replace as required.

## 8.0 REPLACEMENT PARTS - COMPONENT DIAGRAMS

### 8.1 RECOMMENDED SPARE PARTS (ONE YEAR'S USAGE)

<u>Quantity</u>	<u>Stock Number</u>	<u>Description</u>
30	984-003	Dust Bag
2	181-008	Pinch Tube
18	511-000	1/2" x 18' Media Hose (or following)
18	513-000	3/4" x 18' media hose (or above)
1	725-000	PTX-4 Nozzle, 1/4" orifice (or following)
1	716-060	PTMV-6 Nozzle, 3/8" orifice (or above)
2	600-033	CQ-1/2 L Coupling
1	357--099	Foot Control Valve, Complete
1	357-095	Repair Kit for Foot Valve
1	980-015	View Window
1	980-011	Window Gasket
1	<del>971-022</del> 478-013-01	Glove and Gauntlet, per pair
1	971-024	Glove only, per pair
4	<del>971-019</del> 478-013-03 971-018	Left Hand Glove, each R/H Glove

good ~~971-022~~  
~~478-013-01~~

Gauntlet Pair 540